

## Functional Parathyroid Cyst as a Rare Cause of Primary Hyperparathyroidism: A Case Report

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### Abstract

Parathyroid Cysts (PC) comprise rare lesions commonly located in the neck and anterior mediastinal region, being either non-functioning or functioning. Functioning PC can be manifested with signs and symptoms of Primary Hyperparathyroidism (PHPT). We report a case of 59-year-old female patient with symptomatic PHPT, caused by a functioning PC, successfully treated with parathyroidectomy.

**Keywords:** Parathyroid cyst; Parathyroid adenoma; Primary hyperparathyroidism; Parathyroidectomy

### Introduction

Parathyroid Cysts (PC) are rare lesions found in the neck and anterior mediastinal region [1,2]. The vast majority are Non-Functioning (NFPC), commonly presented as asymptomatic nodular cervical lesions. Symptoms and clinical findings of non-functioning cysts are limited mainly to those caused by compression of the adjacent structures, while Functioning Cysts (FPC) are also related to excessive secretion of PTH [1]. Thus, FPC can present with signs and symptoms of Primary Hyperparathyroidism (PHPT) [2]. We report a case of functioning FPC associated with PHPT describing our diagnostic and therapeutic approach.

### Case Presentation

A 59-year-old female was admitted to her endocrinologist reporting severe constipation, polydipsia, fatigue, weakness and proximal muscle weakness of two year duration. Initially, her symptoms were attributed to uncontrolled diabetes and consequently basal insulin was started, but the symptoms were deteriorated.

Previous medical history included hypertension, dyslipidemia and toxic multinodular goiter. No signs were revealed from her clinical examination. Her biochemical evaluation revealed an elevated

serum calcium [11.9 mg/dl (normal range: 8.4-10.4)] and Parathyroid Hormone (PTH) [300 pg/ml (normal range 10-65)]. Neck ultrasound revealed hypoechoogenic thyroid nodules in both lobes and a cystic mass (d:2.6×1.8×3.0 cm) below the right thyroid lobe (Figure 1). The biochemical findings were diagnostic of PHPT and Tc-Sestamibi scintigraphy was suggestive of a hyper-functioning parathyroid tissue at the lower part of the right thyroid lobe.

During the surgical exploration, a large lesion (both solid and cystic) at the place of the right superior parathyroid gland was detected and extracted (Figure 2). Intraoperative PTH levels normalized 20

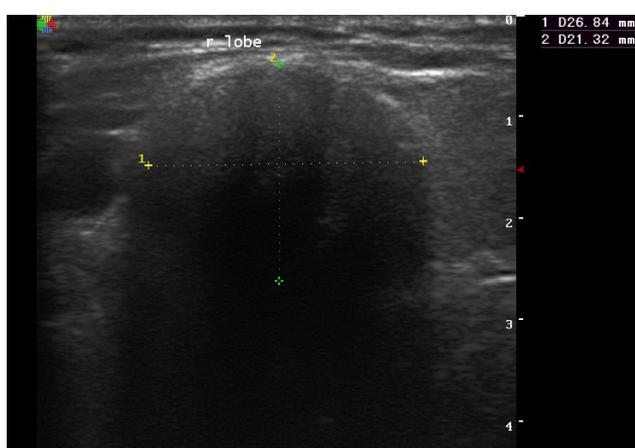


Figure 1: Presumed parathyroid gland at lower third of the right lobe.



Figure 2: Macroscopic appearance of the parathyroid adenoma inside a parathyroid cyst.

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min after the removal of the mass and the operation was terminated, completed also by total thyroidectomy.

Histopathological examination showed that the structure was a parathyroid adenoma inside a parathyroid cyst, 4 cm in diameter. The wall of the parathyroidal cyst was fibrous with deposits of calcium salts, cholesterol crystals, hemosiderin-laden macrophages and islets of parathyroid tissue, consisting of principal, acidophiles and few clear cells. Two months later the patient was euthyroid with normal serum calcium and PTH levels, and remained in this condition on the annual re-evaluation.

## Discussion

PHPT is usually caused by parathyroid adenomas, occasionally by primary parathyroid hyperplasia, but only rarely (<1%) by a parathyroid carcinoma or parathyroid cyst. NFPC represent about 80% of all cases, most commonly in the 4<sup>th</sup> to 6<sup>th</sup> decade [1,2] while FPC represent 0.3-3% of the parathyroids removed due to PHPT [1,3].

NFPC can be asymptomatic and discovered incidentally during physical or imaging evaluation for other reasons, or after surgical excision of thyroid nodules on histological examination. Some cases produce local symptoms depending on the size and location of the cyst. FPC is related to excessive secretion of PTH, manifested with signs and symptoms PHPT and malignant hypercalcaemia or even hypercalcaemic crisis [1,2].

Diagnostic workup includes physical examination, laboratory confirmation, neck Ultrasound (US), Tc-Sestamibi scintigraphy, Computerized Tomography (CT), Magnetic Resonance Imaging (MRI) and Fine-Needle Aspiration (FNA) biopsy. The diagnosis can be established by elevated levels of PTH in the aspirated fluid [2,3].

Histologically, NFPC are lined by a flattened cuboidal or columnar epithelium and several types of parathyroid cells may be found in their wall. FPC lack a formed lining and are more properly termed as

pseudo-cysts and in a few cases an adenoma may be found in the cyst. They may contain hemorrhagic or necrotic foci and brown or turbid fluid with hemosiderin-laden macrophages [4].

The treatment of choice in cases of symptomatic or FPC is surgical resection. Intraoperative measurement of PTH levels is useful but it can be misleading when rupture of the cyst occurs during surgery. FNA of the cyst fluid may be curative in some patients, often resulting in cyst regression. However, PC may recur after aspiration. Sclerotherapy with tetracycline and alcohol can be effective in recurrent lesions, but it could result in fibrosis and recurrent laryngeal nerve palsy [5].

NFPC can be treated with FNA and complete remission can be achieved. Simple observation can be performed in small asymptomatic cysts. The treatment of choice for functioning cysts is parathyroidectomy, as it was performed in our case.

## Conclusion

In conclusion, PC comprises a challenging clinical entity requiring a high index of clinical suspicion.

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